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REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. <u>Rejection of Claims 1-20 under 35 U.S.C. § 102(e)</u>.

Claims 1-20 were rejected under 35 U.S.C. § 102(e) as being anticipated by Greenfield et al. (U.S. No. 5,760,836).

(a)   <u>Claims 1, 9, 19 and 20</u>. Claims 1, 9, 19 and 20 are the independent claims in this application.

Each of these independent claims is directed to a mechanism for encoding a bitstream wherein, <u>in response to detecting an overrun</u>, a catch-up mode is executed for processing the overrun. In other words, the present invention pertains to a post overrun process.

In contrast, Greenfield '836 describes a process for <u>preventing</u> overruns by altering the bit rate being encoded. This is not that same as a process that is executed after an overrun occurs as recited in Applicant's claims.

For the foregoing reasons, as well as the additional reasons set forth below, the Applicant respectfully submits that the grounds for rejection posed by the Examiner are in error and that the rejection should be withdrawn. The following will discuss these shortcomings for each of the pending claims in the instant application.

<u>Claim 1</u>. Claim 1 is an independent method claim which recites three method steps: (1) "determining an overrun..."; (2) "determining the severity of the overrun"; and (3) "encoding a current frame using at least one catch-up mode to process the overrun."

The rejection attempts to equate this claim with the teachings of Greenfield '836 and lists sections of the Greenfield '836 reference as support. However, these sections do not comport to the recited elements in Claim 1, and not all claim limitations are taught.

Specifically, col. 5, lines 27-30; and col. 5, lines 60-67 of Greenfield et al. are relied upon, with the Examiner indicating "that the adjustment step in Greenfield is the

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claimed "catch up"". The sections from Greenfield are quoted below:

Col. 5, Lines 27-30:

> *"By monitoring the amount of data read from the FIFOs and data used to encode the bitstream (E), the bitrate can be adjusted to <u>prevent overflow</u> of the external buffers 51 in a normal operating environment."*

Col. 5, Lines 60-67:

> *"Based on the depth (d) of the FIFO and system characteristics, an experimental limit (L) can be calculated and used to determine the point at which the bitrate should be adjusted <u>to avoid buffer overrun</u>. If BF>L then the stepsize will be increased allowing less bits for encoding. This will be monitored until the bitrate is adjusted such that BF<L. If an overrun does occur, a FIFO reset signal called FIFO.sub.— RST can be pulsed low to reset the external FIFOs."*

From the foregoing it can be readily seen that Greenfield '836 describes a method for <u>preventing buffer overruns</u> not for responding to overruns. This is a different purpose than described by Applicant, and the method steps in the Applicant's claim clearly recites this difference. Paragraph 18 of the instant application even describes the benefits of the invention over prior techniques such as Greenfield et al.'s approach. For example, Paragraph 18 of the Applicant's Specification states: *"...if limited overrun is acceptable, the encoder may yield better quality than forcing the encoder to never overrun."* In the Applicant's invention recited in Claim 1, the method detects that an overrun <u>has occurred</u> and <u>then</u> enters a catch-up mode to remedy the problem.

A review of the cited reference shows that Greenfield et al. changes its bitrate, lowering bitstream quality, to <u>prevent overruns</u> from ever arising. On the other hand, as recited in Claim 1, in the Applicant's invention the overruns are allowed to occur, without changing bitrate, and, in response to the severity of the overrun, the encoder utilizes one or more levels of catch-up.

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Further it should be recognized that Greenfield-836 does not disclose
"determining the severity of an overrun" as recited in Claim 1. In fact, the Greenfield et
al. reference teaches away from allowing an overrun to occur at all. There is no
discussion within the Greenfield et al. reference to support this contention.

Still further, Applicant's Claim 1 recites the use of a "catch-up mode" to "process
the overrun". The Applicant's catch up mode cannot be equated to the change in
bitrate used to prevent overruns. The Applicant processes an overrun condition, which
would not exist in Greenfield et al. since Greenfield et al. is preventing overrun.

From the foregoing, it should be readily apparent that Greenfield et al. does not
teach the elements of Claim 1 and, therefore, a rejection under §102 is unsupported.
Furthermore, without an equivalence between Applicant's claimed elements and the
elements taught by the relied-upon reference, a *prima facie* case of obviousness cannot
be established. See MPEP 2143.

Claim 9.   Claim 9 is an independent claim drawn to *"a system comprising: a
catch-up controller to determine an overrun... and to determine the severity of the
overrun; and an encoder to encode... using at least one catch-up mode to process the
overrun"*.

That rejection of Claim 9 lacks support for the same reasons discussed above
with respect to Claim 1. Claim 9 recited an apparatus that implements the method of
Claim 1 and the elements of Claim 9 are neither taught nor rendered obvious by
Greenfield et al.

Greenfield et al. does not determine overruns and their severity for enacting a
catch-up mode to process the overrun. Greenfield et al. does not even discuss
determining the severity of overruns. Greenfield does mention clearing the FIFO (col.
1, lines 58-60): *"to provide an automatic reset of the FIFOs in the event of overrun"*.
However, since the data is lost when the buffer is reset, this indicates how dire an
overrun occurrence is in the Greenfield system; obviously no "catching-up" could even
be performed after flushing the buffer contents - the data on which a "catch-up" would

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be performed have been irretrievably lost

Claims 19 and 20. Claims 19 and 20 are independent claims that recite a
system or computer readable medium as written in a means-plus-function format.
Claim 20 describes the medium as *"computer readable medium comprising instructions,*
which when executed on a processor, perform a method for timeshifting the encoding
and decoding of a bitstream".

Both of these claims recite a means for determining an overrun, for determining
the severity of the overrun, and for encoding a current frame (obviously after the
overrun) using a catch-up mode to process the overrun. As discussed above in
connection with Claims 1 and 9, Greenfield et al. does not enact a catch-up mode in
response to an overrun, or in response to the severity of the overrun. Greenfield et al.
teaches away from allowing the FIFO to overrun and then enacting special processing
modes to "catch-up" as recited in the Applicant's claims. Furthermore, in the
embodiments of Greenfield et al. a catch-up mode could not even be implemented
because the FIFO is reset upon overrun.

Therefore, the Applicant respectfully submits that Independent Claims 1, 9, 19
and 20 are neither anticipated nor rendered obvious by Greenfield et al. The cited
reference does not teach or suggest the invention of those claims. Furthermore,
Greenfield et al. teaches away from the invention recited in those claims.

(b)   Claims 2-8 and 10-18. These are dependent claims within the Application
and should be considered *a fortiori* allowable in view of the demonstrated patentability
of the independent claims over the relied-upon reference.

However, these claims also recite additional distinctions which have not been
properly considered In relation to the relied-upon reference.

Claims 2 and 10. Claims 2 and 10 depend from Independent Claim 1 and 9,
respectively, and describe the result as *"wherein the encoding occurs without skipping a*
frame of the input bitstream". The Examiner's position on Claims 2 and 10 is difficult for
the Applicant to understand in that the Examiner states that *"Greenfield does not*

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particularly disclose skipping frame, the encoding is assumed without such step. The next encoding Applicant takes that to mean that the Examiner considers the ability not to skip frames the Examiner son as inherent. However, it should be recognized that in response to an overrun Greenfield et al. clears the FIFO containing the frames – which would drop not just a single frame but numerous frames. In the Applicant's invention as recited in Claims 2 and 10, not even a single frame is lost in response to the overrun. This is a significant benefit and point of departure for Applicant's invention, both in inventive purpose and in the recited structure/steps for the invention. Claims 2 and 10 thus provides additional grounds for patentability and are neither anticipated nor rendered obvious by the Greenfield et al. reference.

Claims 3, 4, 11 and 12. Claims 3, 4, 11 and 12 are dependent claims which describe that an <u>anticipated finishing time for encoding</u> is determined and that in one embodiment this is what <u>determines the severity of the overrun</u>.

In support of the rejection of these claims, the Examiner cites a section from Greenfield et al. that purportedly describes *"anticipating of the finishing time for the encoding"*. However, the Applicant submits that the section recited does in no way equates to this recited element. The section relied upon by the Examiner, col. 7, lines 19-34, is as follows:

> *"The encoder can further programmably <u>specify the FIFO buffer configuration</u>. This allows the amount of data to be read out of the FIFO buffer per FIFO buffer read to be programmable, which is especially important when the amount of data read out of the FIFO buffer per FIFO read does not match the output buffer line width.*

> *According to another embodiment of our invention the processor or controller of the <u>encoder controls a FIFO buffer fullness limit</u> in order to control the timing and amount of the quantization factor. This <u>avoids FIFO buffer overflow</u> and the loss of data.*

> *The system shown in FIGS. 1 and 5 controls FIFO buffer 51 fullness to avoid loss of data and also resets the FIFO buffer 51 in the event of overflow to restart the FIFO read process."*

The relied upon section discusses changing the size of the buffer within the means or changing programming in response to the buffer line width or other aspect. There is no mention of buffer line width whatsoever of anticipating the finishing time of encoding.

Furthermore, in the grounds for rejection the Examiner does not even mention the further limitation of Claims 4 and 12 which addresses utilizing the estimated finishing time for the encoding to determine the severity of the overrun. There is simply nothing in the Greenfield et al. reference that supports a rejection of these claims.

Therefore, Claims 3, 4, 11 and 12 each recite additional aspects of the invention which support patentability. Claims 3, 4, 11 and 12 are neither anticipated nor rendered obvious by Greenfield et al.

Claims 6 and 14. Claims 6 and 14 are dependent claims which describe that additional overruns do not occur during catch-up processing. It has already been shown that Greenfield et al. does not teach any mechanism for catch-up processing, and in fact teaches away from it, since Greenfield et al. resets the FIFO any time an overrun occurs. Therefore, it is impossible and a non-sequitor to perform catch-up processing. In addition, there is no hint of subsequent overrun processing within Greenfield et al. since it teaches preventing any overrun and as the FIFO is reset in response to an overrun this again indicates that the any additional overrun is not connected with any previous one since the buffer contents have been flushed.

Therefore, Claims 6 and 14 each recite additional aspects of the invention which support patentability. Claims 6 and 14 are neither anticipated nor rendered obvious by Greenfield et al.

Claims 7, 8, 15-18. Claims 7, 8, and 15-18 are dependent claims which describe aspects of the catch-up encoding modes of the system. The Applicant respectfully asserts that the rejection improperly attempts to equate these catch-up encoding modes in the Applicant's claims with the adjustment of buffer fullness limits found in Greenfield et al. at col. 7, lines 19-34 (the text is included above with regard to discussion of Claims 3, 4, 11 and 12). Again, it should be recognized that Greenfield et

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al. does not describe any catch-up modes, and not only teaches away from them but its very design would prevent one from adding these to the encoder as the buffer contents are lost if ever an overrun occurs. There are also no modes discussed in Greenfield et al. for altering the encoding aside from changing quantization. Therefore, neither of these claim aspects can be equated with the cited reference.

In addition, many of these claims provide additional limitations which are not specifically addressed by the rejection, and for which there is nothing remotely similar in the relied-upon reference. For example, Claims 8 and 16 describe a *"plurality of rate control processes"*. It should be recognized that the instant application describes different methods of encoding to speed up the process in response to the severity of an overrun.

Therefore, Claims 7, 8 and 15-18 each recite additional aspects of the invention which support patentability. Claims 7, 8 and 15-18 are neither anticipated nor rendered obvious by Greenfield et al

2.   Claims 1-20 are nonobvious.

As explained above, Claims 1-20 are neither anticipated nor rendered obvious by Greenfield et al. More particularly with regard to obviousness, the subject matter of Claims 1-20 would not have been obvious to a person having ordinary skill in the art in view of Greenfield et al. alone or in combination with another other reference. Greenfield et al. not only teaches away from allowing overruns to occur, but flushes the buffer if one ever does occur, it could not be combined with any teaching to provide the catch-up modes recited in the Applicants claims.

Therefore, since there is no way to provide catch-up modes from the Greenfield et al. reference, Claims 1-20 recite elements which would be non-obvious over any combination with Greenfield et al. for purposes of 35 U.S.C. § 103.

3.   Traversal of Rejection of Claims 19, 20; In re Donaldson.

In addition to the reasons given above for patentability of Claims 19 and 20, the Applicant also respectfully traverses the grounds for rejection and cites *In re*

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Donaldson, 16 F.3d 1189, 1193 (Fed. Cir. 1994)(en banc) as the basis for the traversal. Claims 19 and 20 are written in means plus function form pursuant to 35 U.S.C. § 112 means plus function sixth paragraph, and therefore, must be interpreted during examination under In re Donaldson.

In rejecting Claims 19 and 20, the Examiner made no specific fact findings as to the scope of equivalents for the means plus function elements in the claims. Instead, the Examiner appears to have followed the provisions of MPEP § 2183 ("Making a Prima Facie Case of Equivalence"), which states:

> If the examiner finds that a prior art element performs the function specified in the claim, and is not excluded by any explicit definition provided in the specification for an equivalent, the examiner should infer from that finding that the prior art element is an equivalent, and should then conclude that the claimed limitation is anticipated by the prior art element. The burden then shifts to applicant to show that the element shown in the prior art is not an equivalent of the structure ... disclosed in the application. In re Mulder, 716 F.2d 1542, 219 U.S.P.Q. 189 (Fed. Cir. 1983). No further analysis of equivalents is required of the examiner until applicant disagrees with the examiner's conclusion, and provides reasons why the prior art element should not be considered an equivalent.

While the Examiner appears to have followed the provisions of MPEP §2183, such provisions are contrary to Federal Circuit law. The Federal Circuit has held that an examiner "construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof," In re Donaldson, 16 F.3d 1189, 1193 (Fed. Cir. 1994)(en banc), and in so ruling expressly denied that "the PTO is exempt from this mandate." Id. The Federal Circuit added that it was specifically overruling any precedent that suggested or held to the contrary. Id. at 1193-94. In response to the PTO's argument that the court's ruling conflicted with the principle that a claim should be given its broadest reasonable interpretation during prosecution, the Federal Circuit held that the Donaldson decision was setting "a limit on how broadly the PTO may construe means-plus-function language under the rubric of 'reasonable interpretation.'"

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Id. at 1194. In other words, an examiner's claim interpretation is not "reasonable" if it is not based on the specification's description of the implementation of the means element of the claim. The court then said, "Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such [means-plus-function] language when rendering a patentability determination. " Id. at 1195.

Here, as in *Donaldson*, the Examiner is required by statute to look to the Applicant's specification and construe the "means" language as referring to corresponding means disclosed in the specification and equivalents thereof." See id. at 1195. However, the Examiner did not construe the means language of these claims. Nor did the Examiner find, on the basis of specific facts of record here, that the means disclosed in the Applicant's specification were equivalent to that of the cited references. Instead, as prescribed by MPEP §§ 2183-84, the Examiner simply presumed equivalence. The presumption methodology used herein, which the MPEP prescribes, clearly conflicts with the requirements of the Federal Circuit's Donaldson decision. The approach taken by the Examiner in this case also conflicts with *In re Bond*, 931 F.2d 831 (Fed. Cir. 1990).

The very point of these cases is that, in this context, limitations from the specification control the interpretation of the claim. Under §112, paragraph 6, a means-plus-function element of a claim must be construed to mean that which is disclosed in the specification and its equivalents. In *Donaldson*, the Federal Circuit said that "our holding does not conflict with the general claim construction principle that limitations found only in the specification of a patent or patent application should not be imported or read into a claim." In other words, the court was saying that a §112, paragraph 6 "means" element does not need to be "imported or read into" a means-plus-function claim because the specification's limitations and their equivalents are already in the claim by virtue of §112, paragraph 6's command. Thus, the Federal Circuit said (16 F.3d at 1195): "What we are dealing with in this case is the construction of a limitation

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already in the claim in the form of a means-plus-function clause and a statutory form mandate on how that clause must be construed."

Based on the foregoing, the Applicant respectfully submits that the rejection of Claims 19 and 20 lacks proper foundation and that the rejection should be withdrawn. Those claims, each of which include means plus function limitations, should have been interpreted in view of the specification as required by *In re Donaldson*. If those claims had been so interpreted, they would have been found allowable since the cited references do not, singly or in combination, teach, suggest or provide motivation or incentive for the subject matter recited in those claims.

4.   Amendment of Claim 17.

Claim 17 was amended to fix a typographical error in the word "control".

5.   Conclusion.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

The Applicant also respectfully requests a telephone interview with the Examiner in the event that there are questions regarding this response, or if the next action on the merits is not an allowance of all pending claims.

Date: _____2/17/05_____   Respectfully submitted,

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